

mena are too various, and the Calculations whereby they follow from those Propositions too intricate to be here prosecuted. I content my self with having prosecuted this kind of Phænomena so far as to discover their cause, and by discovering it to ratify the Propositions in the third Part of this Book.

## O B S. XIII.

As Light reflected by a Lens quick-silvered on the back-side makes the Rings of Colours above described, so it ought to make the like Rings of Colours in passing through a drop of Water. At the first reflexion of the rays within the drop, some Colours ought to be transmitted, as in the case of a Lens, and others to be reflected back to the Eye. For instance, if the Diameter of a small drop or globule of Water be about the 500th part of an Inch, so that a red-making ray in passing through the middle of this globule has 250 fits of easy transmission within the globule, and that all the red-making rays which are at a certain distance from this middle ray round about it have 249 fits within the globule, and all the like rays at a certain further distance round about it have 248 fits, and all those at a certain further distance 247 fits, and so on; these concentrick Circles of rays after their transmission, falling on a white Paper, will make concentrick rings of red upon the Paper, supposing the Light which passes through one single globule strong enough to be sensible. And, in like manner, the rays of other Colours will make Rings of other Colours. Suppose now that in a fair day the Sun shines through a thin Cloud of such  
globules

globules of Water or Hail, and that the globules are all of the same bigness, and the Sun seen through this Cloud shall appear encompassed with the like concentrick Rings of Colours, and the Diameter of the first Ring of red shall be  $7\frac{1}{2}$  degrees, that of the second  $10\frac{1}{2}$  degrees, that of the third  $12$  degrees  $33$  minutes. And accordingly as the globules of Water are bigger or less, the Rings shall be less or bigger. This is the Theory, and experience answers it. For in *June* 1692. I saw by reflexion in a Vessel of stagnating Water three Halos Crowns or Rings of Colours about the Sun, like three little Rainbows, concentrick to his Body. The Colours of the first or innermost Crown were blue next the Sun, red without, and white in the middle between the blue and red. Those of the second Crown were purple and blue within, and pale red without, and green in the middle. And those of the third were pale blue within, and pale red without; these Crowns inclosed one another immediately, so that their Colours proceeded in this continual order from the Sun outward: blue, white, red; purple, blue, green, pale yellow and red; pale blue, pale red. The Diameter of the second Crown measured from the middle of the yellow and red on one side of the Sun, to the middle of the same Colour on the other side was  $9\frac{1}{2}$  degrees, or thereabouts. The Diameters of the first and third I had not time to measure, but that of the first seemed to be about five or six degrees, and that of the third about twelve. The like Crowns appear sometimes about the Moon; for in the beginning of the year 1664, *Febr.* 19th at night, I saw two such Crowns about her. The Diameter of the first or innermost was about three degrees, and that of the  
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